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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,450	02/23/2002	Jian Zhu	Li 25	8324

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PHILADELPHIA, PA 19103

EXAMINER

MERED, HABTE

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,450

Applicant(s)

JIAN ZHU ET AL

Examiner

Habte Mered

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The preliminary amendment filed on 2/23/2006 has been entered and fully considered.
2. **Claims 1-6** are pending.

Claim Objections

3. **Claims 2 and 5** are objected to because of the following informalities: the phrase "switching element is a bicast cell" is inconsistent with the terminology used in the art. A cell is known to be a fixed size packet and is not used to describe a switching hardware element in the art. The Examiner suggests using one of the following phrases instead – "a bicast switching element" or "a switching element with bicast connections" Appropriate correction is required.
4. **Claims 3 and 6** are objected to because of the following informalities: the phrase "switching element is a routing cell" is inconsistent with the terminology used in the art. A cell is known to be a fixed size packet and is not used to describe a switching hardware element in the art. The Examiner suggests using one of the following phrases instead – "a routing switching element" or "a switching element with routing capabilities" Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1 and 4** are rejected under 35 U.S.C. 102(e) as being anticipated by Carson et al (US 6, 829, 237), hereinafter referred to as Carson.

Carson discloses a multi-stage interconnection network, which has N input ports and N output ports.

Carson discloses a method and system for routing packets through a switching network, wherein the switching network includes multiple stages of switching elements **(See Figure 6)**, each one of the switching elements receiving packets as local input packets on its input ports and producing packets as local output packets on its output ports **(See Figure 6, elements 323, 322, and 321 are the different switching stages)**, each of the packets having a plurality of in-band control signals where each one of the in-band control signals is utilized **(Figure 6, elements 314x and 314)** in a corresponding one of the switching elements as the local in-band control signal for the corresponding switching element to make switching decisions, the method comprising coding each one of the in-band control signals of the packets into a plurality of bits based on a predetermined coding algorithm **(See Column 3, Lines 50-67 - the logarithmic function described by Carson can easily be considered as a coding algorithm and see also Figure 5)**, and generating, with reference to the coding scheme, the output bits of the local output packets at each one of the switching elements based on a subset of the bits in the corresponding one of the in-band control signals for each one of the switching elements to route the local input packets arriving at

the corresponding switching element. (See Column 3:50-67 and Column 4:1-45 and Figures 5 and 6. Note that in both Figures 5 and 6 the address in the header, i.e. in-band control signal, is chopped off as the packet is routed from stage to stage and the pure data is retrieved at the last stage of the routing.) Carson discloses that the control processor shown in Figure 17 does the encoding and generating of the in-band control signals.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 2, 3, 5, and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson et al (US 6, 829, 237), hereinafter referred to as Carson in view of Park et al (Jaehyung Park, Lillykutty Jacob, and Hyunsoo Yoon, "Performance Analysis of a Multicast Switch based on Multistage Interconnection Networks", Pages 939-946, IEEE, 1997), hereinafter referred to as Park and Chiussi et al (US 5, 689, 506), hereinafter referred to as Chiussi.

9. Regarding **claims 2 and 5**, Carson fails to disclose a method and system wherein each one of the switching elements is a bicast cell, and that the local input packets to each one of the switching elements includes 0-bound, 1-bound and bicast packet types wherein each one of the packet types corresponds to a distinct in-band

control signal, the coding includes coding each of the in-band control signals by at least two bits, and the coding algorithm includes coding the bits such that the first bit of the code for the in-band control signal corresponding to a 0-bound packet type is different from the first bit of the code for the in-band control signal corresponding to a 1-bound packet type.

Park teaches multicasting in the self-routing multistage.

Park discloses a method and system wherein each one of the switching elements is a bicast cell (**Any of the switching elements in Figure 2 and 3 are capable doing multicasting operation by forming bicast connections as seen in particular in Figure 3**), and that the local input packets to each one of the switching elements includes 0-bound, 1-bound and bicast packet types wherein each one of the packet types corresponds to a distinct in-band control signal (**See Page 941, Column 1:8-16**), the coding includes coding each of the in-band control signals by at least two bits (**See Page 941, Column 1:27-28**), and the coding algorithm includes coding the bits such that the first bit of the code for the in-band control signal corresponding to a 0-bound packet type is different from the first bit of the code for the in-band control signal corresponding to a 1-bound packet type (**See 1st Bullet item on Page 941 in Column 1**).

10. Regarding **claims 3 and 6**, Carson fails to disclose a method and system wherein each one of the switching elements is a routing cell, and that the local input packets to each one of the switching elements includes 0-bound, 1-bound and bicast packet types wherein each one of the packet types corresponds to a distinct in-band

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control signal, the coding includes coding each of the in-band control signals by at least two bits, and the coding algorithm includes coding the bits such that the first bit of the code for the in-band control signal corresponding to a 0-bound packet type is different from the first bit of the code for the in-band control signal corresponding to a 1-bound packet type.

Park discloses a method and system wherein each one of the switching elements is a routing cell (**Park discloses each of the broadcasting switching elements are capable of routing packets based on header info included in the packet and therefore each switching element is a routing switch element**), and that the local input packets to each one of the switching elements includes 0-bound, 1-bound and bicast packet types wherein each one of the packet types corresponds to a distinct in-band control signal (**See Page 941, Column 1:8-16**), the coding includes coding each of the in-band control signals by at least two bits (**See Page 941, Column 1:27-28**), and the coding algorithm includes coding the bits such that the first bit of the code for the in-band control signal corresponding to a 0-bound packet type is different from the first bit of the code for the in-band control signal corresponding to a 1-bound packet type (**See 1st Bullet item on Page 941 in Column 1**).

11. With respect to **claims 2, 3, 5, and 6**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Carson's method and system to incorporate switching elements with multicasting capability wherein each one of the switching elements is a routing bicast cell, and that the local input packets to each one of the switching elements includes 0-bound, 1-bound and bicast packet types

wherein each one of the packet types corresponds to a distinct in-band control signal, the coding includes coding each of the in-band control signals by at least two bits, and the coding algorithm includes coding the bits such that the first bit of the code for the in-band control signal corresponding to a 0-bound packet type is different from the first bit of the code for the in-band control signal corresponding to a 1-bound packet type. The motivation being since switching involves both multicast and unicast traffic in large volumes such a feature will aid in broadcasting packets to multiple end users.

12. With respect to **claims 2, 3, 5, and 6**, Carson also fails to disclose a method and system that routes idle packets.

Chiussi discloses a multicast routing in multistage networks.

Chiussi discloses a method and system that routes idle packets. (**See Column 12:55-60**)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Carson's method and system to incorporate a method and system that routes idle packets. The motivation being an idle cell can be used to send backpressure bitmap as illustrated in Chiussi in Column 14:52-54.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


The Applicant's invention is fully disclosed by Li et al (Cheng Li, Howard M. Heyes, and R. Venkatesan, "Design and implementation of the scalable multicast balanced gamma switch", IEEE, 10/2002)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
09-23-2006



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